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ABSTRACT

This paper focuses on the relationship between trainees' attitudes and learning performance in computer courses. Based on the assumption that university graduates must be computer literate before entering the workforce, a study was conducted to examine how attitudes held before attending a computer course differed on the basis of gender, intention to purchase a computer, and ownership of a computer. A survey of 156 students who had enrolled in a required university computer literacy course yielded a 70% participation rate. The study revealed that gender and ownership of a computer were responsible for attitudinal differences, while intent to purchase a computer was not. Students who withdrew from the course during the semester and students in the course with lower ability both perceived the computer as increasing job complexity. Ownership of a computer eliminated almost all gender differences in computer attitudes. A discussion of the implications of these results for managers and future research concludes the paper. and 11 tables of statistical data are attached. (45 references) (DB)

COMPUTER ATTITUDES AND LEARNING PERFORMANCE: ISSUES FOR MANAGEMENT EDUCATION AND TRAINING[1]

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COMPUTER ATTITUDES AND LEARNING PERFORMANCE: ISSUES FOR MANAGEMENT EDUCATION AND TRAINING

Abstract

This study examines how attitudes held before attending a computer course differ on the basis of gender, intention to purchase a computer, and owning a computer. Results indicate that gender and owning a computer are responsible for attitudinal differences, while intent to purchase a computer is not. Further analyses reveals that attitudes differ between learning performance groups. More than all other groups, students who withdrew from the course during the semester and students in the course with the highest performance level both perceive the computer as increasing job complexity. Owning a computer eliminates nearly all gender differences in computer attitudes. The implications of these results for managers and future research are discussed.

COMPUTER ATTITUDES AND LEARNING PERFORMANCE: ISSUES FOR MANAGEMENT EDUCATION AND TRAINING

How training should be evaluated has figured prominently in the literature (e.g., Fossum, Arvey Paradise & Robbins, 1986, Goldstein, 1980). Although theory has suggested that positive attitudes[1] are important to management training and learning in general (e.g., Ford & Noe, 1987, Noe 1986), past research has primarily concentrated on the effects of ability level upon learning performance (e.g., Ackerman, 1987; Adams, 1987).

While rapid technological change requires today's university graduates to become computer literate before entering the workforce (Jones & Lavelli, 1986), research which assesses the relationship between trainees' attitudes and learning performance in computer courses is lacking (Burke & Day, 1986). A great challenge for educators is to provide adequate computer training (Leontief & Duchin, 1986) which is applicable to the workplace (Ford & Noe, 1987). Variables such as gender, computer ownership and learning performance, and their relationship with trainees' attitudes towards computers, are the focus of this study.

Attitudes and Learning Performance

In recent years, almost all research on training and learning has been situationally based, situational variables such as learning environment, and method of instruction have commonly been isolated as determinants of learning outcomes (e.g., Burke & Day, 1986; Kanfer & Ackerman, 1989). Rarely, however, is it recognized that learning outcomes have another source of variance, the individual's attitudes (Dweck, 1986; Noe, 1986; Noe & Schmitt, 1986).

The hypothesis that attitudes affect learning outcomes in computer training is based upon three previous findings. Firstly, substantial individual variation occurs in the perception of identical tasks, work situations and technology's effect upon work (O'Reilly, Parlette & Bloom, 1980). Secondly, there is substantial evidence that negative attitudes toward a situation (e.g., computer-mediated work) negatively affect learning (Ames & Archer, 1988, Dweck, 1986; Keith, 1982, Lepper, 1985). Thirdly, the degree to which a person in the workplace effectively applies knowledge and skills gained in a training context is largely dependent upon that subject's attitudes toward training (Ford & Noe, 1987, Noe & Schmitt, 1986).

In a recent article which reviewed the literature on management training, Noe (1986) stated that past research has neglected the influence of attitudes upon the effectiveness of training. Moreover, he hypothesized that, if one was to assume similar ability levels among trainees, those with positive or enthusiastic attitudes toward the subject (e.g., computer-mediated work) would likely acquire more knowledge and skills.

Gender. In a recent literature review, Jacklin (1989) concluded that gender is not an important variable in the measurement of intellectual abilities. Nonetheless, researchers investigating attitudes toward computers in various work settings, report that males and females differ (e.g., Perolle, 1987, Mankin, Bikson & Gutek, 1984). It is also reported that women are more concerned than men are with the idea that computers can have detrimental effects on a person's health (e.g., Stellman, Klitzman, Gordon & Snow, 1987).

The studies mentioned above all used respondents who had several years of experience with computer mediated work. As computerization has generally affected female-dominated occupations more than those dominated by males, some literature has suggested that the above gender-based attitudinal differences are largely due to different experiences with computers in the workplace (e.g., Form & McMillen, 1983). Others have argued that differences in attitudes may instead be attributed to socialization regarding technology. It has been pointed out that, in the past, society has viewed computer technology as highly technical and part of a male domain (e.g., Campbell & McCabe, 1984, Lowe & Krahn, 1988). Today's young adults, who are preparing themselves to enter the workforce (e.g., university students), are really going to be the first generation of "information age" workers. Technology may be causing an increase or decrease in gender differences. Therefore, understanding gender-based attitudinal differences, or a lack thereof, will have important implications pertaining to training and application of training in the workplace (Bikson, Gutek & Mankin, 1987). Hence, the following question will be addressed:

Question 1. Can individuals' attitudes regarding computers be classified according to gender?

Career preparation and computers. Increasingly researchers have reported that a successful career in management requires computer skills to be acquired prior to entry into an occupation or organization (e.g., Jones & Lavelli, 1986). While firms are cutting back on computer training (Cooper McGovern, 1988), universities, especially their business schools, must offer programs in response to increased demand.

To facilitate the acquisition of computer skills, some universities have started to require that freshmen own computers, and organizations are beginning to support, with financial assistance and training, computer purchases by their employees. In both situations, the individual has invested something of value (i.e. dollars) which would be lost if he/she could not use the computer to advance his/her career opportunities. Because of the investment, such a situation may lead to psychological bolstering or justification of one's action (e.g., Pfeffer & Lawler, 1980, Noe, 1986; Steers & Porter, 1983), which results in more positive attitudes toward computer technology. Because a change in attitude may occur when a person has access to a computer (Lowe & Krahn 1988), the following questions arise:

Question 2. Can individuals' attitudes regarding computers be classified based on whether or not they intend to purchase a computer?

Question 3. Can individuals' attitudes regarding computers be classified based on whether or not they own a computer?

Question 4. Using the variables which are significant (Questions 1 - 3), are the mean values obtained for the various groups significantly different?

Training effectiveness and learning performance. While it is already situationally established in the workplace that attitudes affect performance, a major focus of this study was to determine whether attitudinal differences relate to a person's computer performance in training as has been suggested (Noe, 1986). If a relationship exists, this would confirm the hypothesis made earlier that attitudes effect training performance (e.g., Noe, 1986; Noe & Schmitt, 1986) and, therefore, has important implications upon management training and university education (Lepper, 1985, Keys & Wolfe, 1988).

A training program's effectiveness is in part measured by the participants' successful completion of the course (Burke & Day, 1986). Sometimes students, whom it appears may not succeed in the course, will withdraw during the semester[2]. Should the proposed relationship between attitudes and learning performance exist in computer training courses, it would be of interest to see if such students differ in their attitudes from those who complete their course.

> *Question 5. Do attitudes play a part in determining the effectiveness of respondents' learning performance (as measured by the letter grades, A-D, awarded for the course[3])?*

Method

Research Setting

The computer course used in this study was designed to impart a degree of computer literacy to the student so that he/she might be more effective in a work environment employing computers. The course is a graduation requirement, but students already possessing skills in this area may obtain credit by passing the final exam without having put in class hours. A total of 156 students who had completed the course in five consecutive university semesters (Spring, Summer & Fall) were included in this study.

Administration Procedures and Measures

During the first "hands on" computer session, each student was handed a confidential questionnaire and was asked to fill it out and hand it in at either the end of class or at the beginning of the next. The surveys were distributed and collected by the researchers, who were not in any way involved with course delivery. Subjects were informed that the survey was for research purposes and that participation was entirely voluntary. The student participation rate was above 70%.

The purpose of the questionnaire was to assess students' attitudes regarding computers. The survey was developed for this study and was based on an extensive literature review. For instance, the literature indicated that health issues are of great concern to most employees when talking about computer-mediated work (e.g., Stellman, Klitzman, Gordon & Snow, 1987). Additionally, up-skilling or de-skilling may occur with changes in the type of work and its complexity (i.e., the introduction of, or increase in computer use) (e.g., Spenner, 1983; Attewell, 1987). As well, research indicates that computers are assumed to affect productivity and, in some cases, have been accused of replacing workers (e.g., Bikson, Gutek & Mankin, 1987, Attewell, 1987). Rather, than assessing general attitudes towards computers, the questions specifically asked respondents how they felt computers might affect work with reference to the above issues (e.g., Chen, 1986; Morrison, 1983).

The survey consisted of two sections. The first section of 17 questions asked the individual about his or her attitudes regarding computers. The questions are listed in Table 1. Each item was evaluated on a five-point scale, ranging from (1) "agree completely," to (5) "disagree completely". The last section of the survey contained questions asking for background information, including age and gender.

<u>Definitions of Training Content, Training Methods and Performance Criteria</u>

This computer course was designed to provide students with knowledge and understanding of the principles of intelligent workstations and of the larger systems in which they often play a part, which Tornatzky (1986) suggests is appropriate. Generalized problem solving and decision-making skills were emphasized as they are applicable to the wide range of work problems that managers encounter. The course consisted of lectures and hands on computer practice. The objective of the lecture portion of the course was to give the student some technical knowledge concerning makes of computers, flowcharting, system design, and mainframe and local area networks. Information system management concepts and decision making theory were taught to give students the depth of knowledge needed to master various work situations. Written tests were used to evaluate learning of lecture material.

The hands-on practice portion of the course trained students to use the computer by teaching them the Disk Operating System (DOS), WordPerfect, Lotus, dBASE and ABstat statistical software (in that sequence). Skills required for using the local area network, electronic mail, and to up and download data to and from the mainframe computer were also introduced. Students were taught

BASIC to enable them to instruct the computer in a programming language. Evaluation for this section of the course took the form of office-work styled information tasks involving problem-solving with the help of the computer. The lecture and lab portions each counted for 50% of the overall course grade.

Results

Factors in Computer Attitudes

To obtain the independent factors, orthogonal varimax rotations were done for the 17 items measuring computer attitudes. Loadings greater than .30 were statistically significant ($p < .001$, according to the Burt Banks criterion)(Child, 1970). All 17 items measuring computer attitudes loaded beyond .50 and were thus retained to define the following five factors. (1) complexity, (2) productivity, (3) health, (4) interesting work, and (5) consequences of computers (see Table 1).

Insert Table 1 about here

The reliabilities obtained for the scales were, except for consequences of computers, well above the desirable minimum of .70 suggested by Nunnally (1978, p. 245) (see Table 1).

Discriminant Analysis

In order to classify students according to their computer attitudes, discriminant analysis was performed[4]. A table of scale means, standard deviation, and a correlation matrix is included to provide the relevant descriptive analysis of the data (see Table 2)[5].

Insert Table 2 about here

The next step was to examine the relationship between the independent variables and the discriminant functions. The standardized coefficients were used to display the relative importance of each variable (Pedhazur, 1982, p. 701). The larger the number, ignoring the sign, the larger the influence that variable has in determining the scores of the discriminant function (Weiss, 1976, pp. 335 337).

When two variables are highly correlated, but their influence is significant in opposite directions, they cancel each other out. The results in Table 3 indicate that while the "consequences of computers" factor has the largest influence for discriminating respondents based on gender (Question 1) and owning a computer (Question 3), the productivity factor is most important for discriminating respondents based on intention to buy a computer (Question 2).

Insert Tables 3, 4, & 5 about here

To assess whether gender differences in combination with one's intention to buy a computer (yes or no) did exist further analyses were done. The results in Table 4 show that the largest discriminant weight obtained for males is for complexity, while for females it is for productivity. To appraise whether gender differences in combination with computer ownership (yes or no) helps to discriminate between groups a further discriminant analysis was performed. The results in Table 5 show that the largest discriminant weight obtained for males is for complexity, while for females the factor measuring perceived computer consequences is most important.

Insert Tables 4 & 5 about here

Some cautionary remarks regarding the above results seem necessary. The true relationship between the function and the individual independent variable may not be represented by the standardized coefficients (Tabachnick & Fidell, 1983, chapter 9). Since structure coefficient measures are bivariate correlations, the relationship with other variables has no effect on their measure versus the discriminant function. Due to this situation, it is often better to consider the structure coefficients (Klecka, 1980, p. 34). Structure coefficients determine the similarity between an individual variable and the discriminant function. The higher the absolute coefficient is, the stronger its relationship to the discriminant function. None of the absolute coefficients reached near 1 or -1, which would allow a function to be named after the variable (Klecka, 1980, p. 31). Nevertheless, the structure coefficients for the most important factors and discriminant functions as listed in Tables 3, 4 and 5 (bold) are satisfactory in magnitude (Klecka, 1980, p. 31).

Research Questions 1, 2 and 3

Because most social science research in this area appears not to advance beyond what we have discussed abov , (and has been cr ized by some for this) (e.g., Klecka, 1980; Marascuilo & Levin, 1983, chap. 7), further analyses are necessary to answer our questions. The canonical correlation measures the degree of the relationship between group membership and independent variables (Tabachnick & Fidell, 1983, chapter 9). The higher the value, the greater the degree of relatedness, ranging from 0 to 1 (Klecka, 1980, p. 36). The squared canonical correlation represents the portion of the variance in the discriminant function that is explained by the groups (Klecka, 1980). If groups are not very different, then the canonical loadings will be very low. In this study, Wilke's lambda was used. If it approaches 1, then this is further indication that no difference exists between groups (Klecka, 1980, p. 39).

Insert Table 6 about here

Looking at Wilke's lambda as obtained for the different discriminant functions listed in Table 6, reveals that four of the seven dependent variables show significant differences between the groups. Specifically, these are gender, buying a computer, owning a computer, and females owning a computer. Nevertheless, the discriminant functions, both males and females with intentions to buy computers, as well as males owning a computer, indicate non significant canonical loadings. Thus these groups are not significantly different. Based on these results, Questions 1 (Can individuals' attitudes regarding computers be classified according to gender?) and 3 (Can individuals' attitudes regarding computers be classified according to whether or not they own a computer?) can be answered with a <u>cautious yes</u>, since some significant differences between groups were obtained. Nevertheless, because Wilke's lambda is quite high, the data also demonstrates that the differences are minor in magnitude. Question 2, (Can individuals' attitudes regarding computers be classified based on whether or not they intend to purchase a computer?) has to be answered with a no, since intention to purchase did not allow us to group individuals according to their computer attitudes.

The final step is look at a prediction table to see how many items were properly predicted by the discriminant function. The tau value indicates the percent fewer errors that would be expected from classification based on the discriminating function rather than on random assignment (Klecka, 1980, pp. 49-51). Thus the prediction tables, along with the tau values, are used to evaluate how much better the discriminant function predicts group membership than does random assignment (Klecka, 1980, pp. 49-51).

Insert Table 7 about here

The tau values in Table 7 reveal that females owning a computer is the dependent variable which can best be predicted by its discriminant function, which predicts group membership 56.5% more accurately than random assignment. In contrast, the discriminant functions gender, intention to buy a computer, and owning a comnuter respectively, predict group membership 13.9%, 18.8%, and 34.9% more accurately than random assignment. These three percentages are relatively small, confirming the results presented in Table 6.

Research Question 4

Question 4 asked if the grouping variables which are significant (Questions 1 - 3) result in significantly different mean values for attitudes associated with each group. Looking at Tables 6 and 7 it is obvious that owning a computer and being female owning a computer are grouping variables of the greatest magnitude in this research. Therefore, the following analysis will limit itself to testing whether two variables, namely gender and owning a computer, will result in significantly different mean values on the attitude scores for the five scales. Looking at the overall F-test shows that only the complexity and interest scales are significantly different for these variables (cf. Table 8).

Insert Table 8 about here

The above indicates that the equality of means for both complexity and interest scales can be rejected. Although the overall F-test was not significant for the other scales, contrasts can still be done to unveil potential differences between sub-groups (Kirk, 1982, pp. 94-105). Hence comparison among means between the different groups were done using Scheffé's test of simple effects. The alpha level was set at $p < .05$. Table 9 lists the results as obtained doing the a posteriori contrasts. The F values are reported in Table 9.

Insert Table 9 about here

The data shows that the groups women without computers versus men without computers and men without computers versus women with computers are significantly different when looking at the complexity scale (F = 561.18 and 328.51 respectively, $p < .001$) and the interest scale (F = 815.99 and 379.20 respectively, $p < .001$). Comparisons between these groups of students for the scales measuring productivity, health and work causes were also statistically significantly different. For instance, men without computers felt that computers were more likely to increase job complexity, productivity and consequences of computer-mediated work, but would not likely lead to consequences such as lay offs. In contrast, women without computers fe... job security and health might be jeopardized by computers, but that work might be made more interesting through the use of technology.

Research Question 5

The fifth question asked if differences between attitudes could affect learning performance, as measured by the letter grades awarded in the course. The results in Table 10 show that the overall F-test is significant only for the complexity factor ($p < .01$).

Insert Tables 10 and 11 about here

As outlined earlier, students withdrawing from the course might have different attitudes than others, hence comparisons were done between this group and all others for all factors. All twenty contrasts were significant ($p < .001$), even though the overall F-test was significant only for the complexity factor. Moreover, for the complexity scale, the means for C and B grades differed from the A group of respondents, while for D students this difference was nearly significant ($p < .06$) (see Table 11). The means obtained for the A and B students were significantly different ($F = 4.07$, $p < .05$) for the productivity scale. B students felt that productivity would be increased more than A students did. Based on these results question 5 can be answered with a cautious yes.

DISCUSSION AND CONCLUSION

The three objectives of this study were (1) to try to classify respondents' attitudes about computers according to gender, owning a computer and intention to purchase one, (2) to determine if these significant group differences would lead to significantly different mean values on the attitude scores; and (3) to see if the hypothesis made in the literature that attitudes relate to learning performance can be supported with data gathered in this study.

The most significant finding may be that gender-based differences in computer attitudes could not be found when comparing computer owners. Since the pre-purchase stage (i.e. intention to purchase a computer) was not a significant discriminant function, these results could be interpreted as, firstly, a self-socialization process for women owning a computer having occurred and eliminating any attitudinal differences with male owners (Jacklin, 1989), and secondly, psychological bolstering of one's decision may have further narrowed attitudinal differences (Pfeffer & Lawler, 1980, Steers & Porter, 1983, p. 428).

Although computer ownership eliminates attitudinal differences between the sexes, the limited relationship between attitudes and learning outcomes raises some questions. Primarily, the hypothesis that attitudes relate to learning performance (e.g., Noe, 1986) requires further testing especially in the context of computer training at universities. In this study, laboratory, lecture and homework assignments were used to teach computer skills. It seems appropriate to propose that future research should test attitudes' relationship with learning outcomes for different teaching methods (cf. Ackerman, 1987; Kanfer & Ackerman, 1989).

In the past, the assumption has been that purchasing a computer (students or employees) influences one's attitudes toward the technology positively (Dierkes & von Thienen, 1984; Menasian, 1985). This study supports this assumption, however, the limited relationship to learning performance questions the usefulness of such an approach. Requiring a student to own a computer increases the student's accessibility to such technology, while limiting the additional financial resources required by the university. However, computer skills required for entering an occupation may depend only upon access to the technology during education and not upon computer ownership per se (Breakwell, Fife-Shaw, Lee, & Spencer, 1987). Assessing computer skills and on-the-job performance in computer-mediated work for both new labour market entrants, who owned a computer when going to university, and others, who had unlimited computer access during their university education (but did not own one), might shed some additional light upon this debate.

If we go beyond the simplest organizational behaviour and training issues, our findings have additional and perhaps more important implications. When we consider, for example, the research findings that depressives are more realistic in their judgments of risk and causation than others (e.g., Alloy and Abramson, 1979), we are led to the conclusion that overly positive attitudes toward computers could actually hinder learning performance. In this study, respondents felt that productivity would increase and work might become somewhat more interesting using computer technology, while health and other computer consequences were perceived somewhat negatively. Most interesting is probably the fact that lower ability students felt that computers would increase job complexity (new skills and tasks). We may need to examine the amount of enthusiasm versus critical thinking needed to provide the most effective training; fitting the individual's attitudes toward computer-mediated work, which would increase transfer of learning to the job.

Footnotes

[1] An attitude is generally seen as a disposition to respond in a favourable or unfavourable manner to an object (Oskamp, 1977, pp. 2-12).

[2] As suggested by one reviewer, one might argue that scheduling or workload considerations as well as possible dislike for the professor may result in the student dropping the course. Although this is a legitimate concern, educational research suggests that such reasons are important at the beginning of a semester (e.g., first week during add and drop period). In the case of this study, this type of "withdrawal" has been excluded from the sample.

[3] Although using grade as a performance measure is far from ideal, it is used extensively in research due to its simplicity and its ability to facilitate comparisons across studies (Campbell & McCabe, 1984). Also, in addition to paper-and-pencil tests, students did work-like assignments using the computer which are generally accepted as constituting a valid evaluation procedure for training effectiveness (Burke & Day, 1986).

[4] Discriminant analysis is one of the sophisticated classification methods which has come into use for studying group differences on several variables simultaneously (Pedhazur, 1982, p. 692). The discriminant function can discriminate among variables which have a differential effect. In the social sciences, there are a wide variety of situations where this technique is useful such as as studying differences based on gender, education and hierarchical level (Klecka, 1980).

[5] Table 2 provides some evidence that the factors created meet the orthogonality assumption of varimax rotation since intercorrelations between factors are minor.

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Table 1

Items Used to Define The Five Factors

Factor	Items	Factor Loadings	% Variance Explained Per Factor	Cronbach's Alpha
I believe that working with computers ...				
Complexity	is very difficult	.740		
	is very complicated	.732		
	requires technical ability	.722		
	is stressful	.588		
	can be done only if one knows a programming language such as Basic	.562		
	requires a lot of mathematical skills	.524		
	is only advisable for people with a lot of patience	.502	18.023	.79
Productivity	helps the company to be more productive	.884		
	makes a person more productive at his/her job	.835		
	is for young people only (R)[1]	.535	11.514	.76
Health	does cause back pain	.765		
	does cause headaches due to eye strain	.739		
	means an intelligent human being interacting with a dumb machine	.524	10.075	.71
Interesting Work	makes one's task more interesting	.886		
	makes work/studying more interesting	.844	10.712	.70
Consequences of Computers	requires that I instruct the machine precisely in order to get tasks done accurately	.665		
	means that some other people may be out of work because of increased efficiency/ productivity	.571	8.451	.68
Total variance explained			58.775	

[1](R) -- This item has been reversed

Note: The above factors were obtained with principle component analysis using a program called systat. Orthogonal varimax rotations were performed on the data for the factor loadings. Only loadings greater than .30 were statistically significant, ($p<.001$) according to the Burt-Banks criterion (Child, 1970). Only factors with an eigenvalue >1.00 were selected (Kaiser, 1974). Each variable was coded from 1 = agree completely to 5 = disagree completely.

Table 2

PEARSON CORRELATION MATRIX, STANDARD DEVIATIONS AND MEANS

	Complexity	Productivity	Health	Interesting Work	Consequences of Computer	MEAN	SD
Complexity	1.000					2.680	.686
Productivity	-.277	1.000				4.229	.612
Health	.160	-.144	1.000			2.822	.820
Interesting Work	.302	.278	-.049	1.000		3.785	.724
Consequences of Computers	.256	-.053	-.009	-.029	1.000	3.721	.790

Note. Scores were added for each scale and divided by the number of items contained in each scale. Hence, the scales' scores range from 1 = agree completely to 5 = disagree completely.

Table 3

SIGNIFICANT DISCRIMINANT FUNCTION AND STRUCTURE COEFFICIENTS FROM GENDER, INTENTION TO BUY A COMPUTER AND OWNING A COMPUTER X ATTITUDES CONCERNING TECHNOLOGY

	Discriminant Function					
	Gender I		Intention to Buy a Computer I		Owning a Computer I	
Measure	w	r	w	r	w	r
Complexity	-.002	-.009	.199	.705	.155	-.565
Productivity	.070	.263	**-.220**	**-.780**	-.135	.490
Health	-.013	-.049	.065	.266	.028	-.099
Interesting Work	-.123	-.466	-.169	-.596	-.138	.500
Consequences of Computers	**.184**	**.702**	.055	.192	**.205**	**-.752**

Note. The most important discriminant functions are listed in bold.

w = standardized discriminant weights, r = structure coefficients

Table 4

SIGNIFICANT DISCRIMINANT FUNCTION AND STRUCTURE COEFFICIENT FROM BUYING A COMPUTER x ATTITUDES CONCERNING TECHNOLOGY

	Discriminant Function			
	Male with Intention to Buy Computer		Female with Intention to Buy Computer	
	I		I	
Measure	w	r	w	r
Complexity	.152	-.712	.282	-.638
Productivity	-.147	.686	-.356	.827
Health	.015	-.070	.165	-.364
Interesting Work	-.142	.664	-.206	.458
Consequences of Computers	.066	-.304	.010	-.022

Note. The most important discriminant functions are listed in bold.

w = standardized discriminant weights, r = structure coefficient

Table 5

SIGNIFICANT DISCRIMINANT FUNCTION AND STRUCTURE COEFFICIENT FROM OWNING A COMPUTER X BELIEFS CONCERNING TECHNOLOGY

	Discriminant Function			
	Male Owning a Computer		Female Owning a Computer	
	I		I	
Measure	w	r	w	r
Complexity	.174	.750	.119	-.182
Productivity	-.056	-.238	-.254	.401
Health	-.030	-.129	.147	-.226
Interesting Work	-.148	-.682	-.100	.154
Consequences of Computers	.091	.389	.459	-.789

Note. The most important discriminant functions are listed in bold.

w = standardized discriminant weights, r = structure coefficient

Table 6

DISCRIMINANT ANALYSIS RESULTS

	Discriminant Function	Canonical Correlation	Wilke's Lambda	p
GENDER	1	.258	.934	.020
INTENTION TO BUY A COMPUTER	1	.277	.923	.024
OWNING A COMPUTER	1	.268	.928	.026
MALE WITH INTENTION OF BUYING A COMPUTER	1	.212	.955	.408
FEMALE WITH INTENTION OF BUYING A COMPUTER	1	.418	.825	.104
MALE OWNING A COMPUTER	1	.229	.948	.285
FEMALE OWNING A COMPUTER	1	.548	.700	.003

Note. Wilke's Lambda is a multivariate statistic assessing the significance of all variables combined.

Table 7

TAU VALUES CALCULATED FROM PREDICTION TABLES

	TAU VALUE
GENDER	.1386
INTENTION TO BUY A COMPUTER	.1882
OWNING A COMPUTER	.3483
MALE WITH INTENTION OF BUYING A COMPUTER	.1966
FEMALE WITH INTENTION OF BUYING A COMPUTER	.2452
MALE OWNING A COMPUTER	.2459
FEMALE OWNING A COMPUTER	.5652

Table 8

COMPUTER OWNERSHIP AND GENDER: COMPARING THE VARIOUS ATTITUDE LEVELS

	WOMEN with a computer (n = 30)	WOMEN without a computer (n = 124)	MEN with a computer (n = 64)	MEN without a computer (n = 204)	OVERALL UNIVARIATE F-TEST
Scale Measures					
Complexity	2.52	2.71	2.32	2.78	7.078***
Productivity	3.28	3.19	3.29	3.26	0.761
Health	2.92	2.80	2.75	2.74	0.47[illegible]
Interesting Work	3.98	3.82	4.08	3.73	3.729**
Consequences of Computers	3.40	3.67	3.64	3.71	1.358

Note. The scales used were disagree completely (1) to agree completely (5).

*p<05
**p<01
***p<001

Table 9

DIFFERENCES IN COMPUTER ATTITUDES BASED ON GENDER AND OWNING A COMPUTER

	F-test			
	WOMEN with computers vs. MEN with computers	WOMEN without computers vs. MEN without computers	MEN without computers vs. WOMEN with computers	WOMEN with computers vs. WOMEN without computers
Scale Measures				
Complexity	1.48	561.48**	328.51***	1.76
Productivity	0.01	1621.70***	786.47***	0.73
Health	0.85	378.47***	173.85***	0.48
Interesting Work	0.31	815.99***	379.20***	1.12
Consequences of Computers	1.98	847.86***	484.85***	2.78

***p<.001

Table 10

COMPUTER ATTITUDES AND LEARNING PERFORMANCE: COMPARING THE VARIOUS LEVELS

	Class Grad					
	Withdrawn (n = 56)	D (n = 19)	C (n = 85)	B (n = 152)	A (n = 107)	OVERALL UNIVARIATE F-TEST
Scales	Mean	Mean	Mean	Mean	Mean	
Complexity	2.62	2.79	2.81	2.72	2.51	2.454**
Productivity	3 32	3.11	3.22	3.30	3.18	1.811
Health	.78	2.54	2.86	2.79	2.70	0.865
Interesting Work	.77	3.92	3.89	3.75	3.87	0.743
Consequences of Computers	3.65	3.63	3.81	3.61	3.64	0.940

Note. The scales used were disagree completely (1) to agree completely (5).

*p<.01

Table 11

COMPUTER ATTITUDES AND LEARNING PERFORMANCE: SPECIFIC COMPARISONS BETWEEN GROUPS

	F-test							
Scales	Withdrawn with D Grades	Withdrawn with C Grades	Withdrawn with B Grades	Withdrawn with A Grades	C Grades with A Grades	B Grades with A Grades	D Grades with B Grades	D Grades with A Grades
Complexity	90.66***	133.48***	152.62***	173.40***	7.97***	5.36**	0.16	2.24
Productivity	413.69***	576.54***	582.98***	606.31***	0.31	4.07*	2.72	0.350
Health	106.60***	129.47***	145.65***	150.55***	1.93	0.82	1.51	0.568
Interesting work	175.26***	265.25***	305.63***	276.96***	0.05	1.45	0.81	0.072
Consequences of Computers	178.71***	241.88***	287.04***	273.89***	2.34	0.05	0.01	0.00

*p<.05
**p<.01
***p<.001

END

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